IMPERIAL
DEPARTMENT OF AGRICULTURE
FOR THE WEST INDIES.

IMPERIAL BUREAU
14 OCT 1929
OF MYCOLOGY

REPORT

ON THE

AGRICULTURAL DEPARTMENT,

ST. LUCIA,

1928.

ISSUED BY THE IMPERIAL COMMISSIONER OF AGRICULTURE
FOR THE WEST INDIES.

[Price Sixpence.]

PRINTED BY THE GOVERNMENT PRINTER AT THE GOVERNMENT PRINTING OFFICE,
CASTRIES, ST. LUCIA.

1929.

FORWARDING DISEASED SPECIMENS FOR EXAMINATION.

PLANTS.

A few fragments of a diseased plant are of practically no value for scientific investigation.

Sufficient material should always be sent so that the primary cause of the trouble may be located.

Full particulars should be given as to the nature of the damage done, the part of the plant attacked, the nature of the soil, drainage, the prevalence of disease, when it was first noticed, and whether any similar kind of disease has been previously observed in the neighbourhood.

Specimens of portions of plants attacked by fungi may be sent green packed in a well-ventilated box if the time taken for delivery is under 24 hours. but if delivery takes a longer time all leaves or soft fruits should be placed in a bottle or corked tube containing a solution made of 1 part of rum or methylated spirit and two parts water. As many stages of the disease as possible should be sent, with notes as to the nature of each stage.

All specimens should be accompanied with detailed particulars of the nature of the disease and should be addressed to :—

THE AGRICULTURAL SUPERINTENDENT,
BOTANIC GARDENS,
CASTRIES.

INSECTS.

Observations and specimens of economic importance or otherwise will always be gladly received.

The following directions should be observed in this respect:—

Living insects should be packed with a supply of the plant on which they are found feeding and the box should have small holes pierced for the purpose of ventilation. This should be carefully packed in such a way as to prevent their becoming crushed in transit.

If it is desired to preserve specimens they should be put in bottles with tightly fitting corks, methylated spirits, diluted rum, etc., making excellent preserving fluids.

Scale insects, etc., should be forwarded on the portion of the plant on which they are found.

If in doubt as to the best method of forwarding specimens, a letter should be sent asking for instructions and stating full details.

In all cases full particulars should be forwarded as to the nature and extent of damage done along with any other important points that may have been noticed.

All specimens should be addressed :—

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BOTANIC GARDENS,
CASTRIES.

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1929.

LETTER OF TRANSMITTAL.

COPY.
C.A. 271.

TRINIDAD,
19TH JUNE, 1929.

Sir,

I have the honour to transmit herewith the report on the working of the St. Lucia Agricultural Department for the year ended December 31st, 1928.

2. The report deals with the usual routine work of the Botanic Gardens and Nurseries and records the removal of the Experiment Station from Reunion to the location formerly occupied by it at Union. This change should result in increased usefulness of the Agricultural Department.

3. The attempt to increase the value of the minor industries by means of trade in fruit and vegetables is a promising line of development.

4. The remarks on Forests and their maintenance are of interest. There can be doubt that considerable areas are rendered useless for long periods by indiscriminate burning.

5. The work recorded under the head of Agricultural Instruction appears to be sound and under the new scheme, which will allow Mr. Niles to spend a greater part of his time in the country districts in connection with advice to peasants and instruction, further progress is to be expected. The lectures to Teachers are a valuable part of this instructional work.

6. The condition of the Agricultural Credit Societies continues to be unsatisfactory. It is to be noted that in the future these Societies are to be placed under the direction of the Treasury.

I have, &c.,

(Sgd.) H. A. BALLOU,
Commissioner of Agriculture.
Imperial College of Tropical Agriculture.

His Honour,
The Administrator,
St. Lucia.

STAFF OF THE AGRICULTURAL DEPARTMENT, ST. LUCIA.

E. A. Walters, F.R.H.S., F.R.Met. Soc. ..	Agricultural Superintendent and Land Officer.
R. W. Niles	Assistant Agricultural Superintendent.
E. L. Daniel	Foreman, Union Station.
W. W. Arno	Clerk to Agricultural Superintendent.
Clement Wardrope	Foreman, Botanic Gardens, Castries.
Simon Joseph Bennett Williams	Plant Inspectors.

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SAINT LUCIA.

Report of the Agricultural Department for the year ended December 31, 1928.

WORK IN THE BOTANIC GARDENS, AND OBSERVATIONS ON PLANTS.

The rainy season of the year 1928 was an abnormally severe one, and was prolonged beyond the usual period (June—October) late into November. Consequently the Botanic Gardens were inundated on several occasions and much difficulty was experienced in presenting a good appearance, the Gardens being already in difficulties as early as January 1928, owing to the heavy rains experienced late in 1927. Work in the Gardens was also strictly limited by the funds available and by the preoccupation of the Department with the reopening of Union Estate as the Agricultural Station. Thus for the greater part of the year the three stations Castries, Reunion and Union were conducted on the funds voted for the two existing stations, Castries and Reunion, and the ornamental work suffered somewhat in the effort to re-establish the important economic section in the new station.

It was therefore decided to concentrate mainly on the upkeep of the grass lawns, and to replant the beds and borders with perennial ornamental shrubs, such as Crotons, Hibiscus, Acalypha, Aralaids and similar hardwood plants, such as are not readily devoured by landcrabs which infest this area, and particularly so after heavy rains.

The established specimens of palms, ornamental and economic trees remained in good condition and are being cared for and replaced as necessary.

The border of palm specimens has been improved by the removal of some of the duplicates which had become overgrown and unsightly.

A selection of the Coniferæ planted at Reunion Station since 1914, has been lifted and transferred to the side of a walk in the Gardens, where it is hoped to establish such good trees as can be moved from this Station, including specimens of Juniperus and Cupressus.

The most effective lawn grass is Java grass, which has proved superior to any of the naturalised or local grasses, and remains refreshingly green throughout the dry season. This grass (*Polytris praemorsa*) was originally introduced as one small turf from Trinidad in 1926 (see Annual Report 1926 p. 2) by the courtesy of Dr. S. C. Harland ; it has now become established in several parts of the Gardens. A second useful grass (as yet undetermined) is one rediscovered at Union Estate and apparently well established there ; this grass has been tried in the Gardens and proves nearly equal to the Java grass ; both kinds should become very serviceable as pasture grasses and are being propagated for that purpose.

The necessary repairs have been made to the roads, fences and culverts, and a concrete greenhouse has been erected in the nursery ; the wooden shade structures in the nursery were being removed at the end of the year and are to be replaced by more permanent screens formed by iron pipes sunk in concrete and roofed with wire netting, over which selected climbing plants will be encouraged to grow. This nursery is now taking over the propagation of all ornamental plants for stock and distribution, the propagation of economics being now concentrated at Union, where suitable conditions exist for ample extension in this work.

PLANT AND SEEDS INTRODUCTION AND EXCHANGE.

The undermentioned seeds and plants are acknowledged with thanks :—

Eucalyptus Naudiniana, Australian Forestry Department, New Guinea ; Pineapple plants. The Curator, Montserrat ; Hybrid limes and Rattan Cane (*Calamus Rotang*) from Director of Agriculture, Trinidad. *Juniperus phoenicia* L. from Brignoles Botanic Station, France, through the Imperial College of Tropical Agriculture ; Guatemala grass, from Agricultural Department, Grenada ; Grapefruit from Mr. H. A. Branch, Corinth Estate, Castries ; seed of *Corypha umbraculifera*, Agricultural Department, Ceylon ; Potato Yam,

from Department of Agriculture, Porto Rico ; Seeds of "Savonette", *Haematoxylon campechianum* and "Locust" from Crown Lands Department, Castries ; *Schinopsis Balansae* Engl. from Royal Botanic Gardens, Kew ; *Indigofera hirsuta*, Soy bean, Jute, *Crotolaria anagyroides*, from Imperial Commissioner of Agriculture, Trinidad ; Grape-vine (purple grape) from Reverend Father Dugast. Castries ; *Ageratum mexicanum*, *Amaranthus caudatus rubra*, *Cupressus Benthami*, White Sapota (*Casimiroa edulus*), *Cassia floribunda*, *Cosmea bipinata*, *Ipomea azurea* Blue Bonnet (*Lupinus*), *Oenothera grandiflora*, Mexican cherry (*Prunus Capuli*), *Zinnia Mexicana*, and Peachmond, from Professor Juan Balme, F.R.H.S., Mexico ; *Adenanthera pavonia*, Linn ; *Arenga sacchari-fera*, Labill ; *Cassia javanica*, Linn ; *Corypha Utan*, Lamk ; *Homalium tomentosum*, Benth ; and *Lagerstromia speciosa*, Pers ; from Mr. W. A. Schipp, Botanist, Java, D.E.I ; Red Cedar (*Cedrela odorata*) from Mr. F. H. Johnson, Soufrière ; Blue Mountain Coffee from Agricultural Department, Jamaica ; Grapefruit plants from Florida, and *Trifolium Alexandrium* from Mr. John Frew, La Perle Estate, Soufrière.

The following Economic plants and seeds were distributed free : —

Seeds of Granadilla (*Passiflora quadrangularis*) to Imperial Department of Agriculture, Trinidad, Seeds of Alfalfa were sent to Mr. John Mason of Berbice, British Guiana ; Vegetable seeds and economic plants were distributed to School Gardens and Peasant Proprietors, also a number of ornamental plants to Public Institutions.

THE CLOSING OF THE AGRICULTURAL STATION, REUNION, AND THE REOPENING OF UNION ESTATE.

The Reunion Station was established in 1913–1914 to serve principally as a propagation station for economic plants and also to promote a land settlement movement which was encouraged by the rising values of the agricultural export staples, sugar and cacao. Unfortunately these products and others of like nature after achieving inflated values during the war period, collapsed during the post-war period of insecure exchanges and poor markets, with disastrous results to the planter. Consequently very little investment in land was made and the lots marked out for a village settlement remained vacant.

The site of this station is also discouraging from the point of view of the nurseryman, being situated on an arid westward slope and exposed to dry land breezes. The soil is derived from the degraded volcanic rock, which is found *in situ* a few feet below the surface ; and there is normally no accumulation of humus.

The development of this site absorbed the greater part of the plant-food occurring in such soil, and any further extension demanded a complete system of irrigation and large quantities of organic manure, both of which required a high expenditure for useful results to be obtained.

Concurrently with the decreased demand for the staples, the policy of the Government became one of strict economy, and the anticipated extension of road transport was unavoidably postponed.

Consequently this district became even more isolated than before and the work of the Agricultural Station was becoming practically unknown through the absence of visiting planters, the general expression being one of dissatisfaction with the site and the results of the Station. Emphasis was given to this feeling by the transfer of agricultural head-quarters to Castries in 1926, where it is for all practical purposes in the centre of the planting interests.

The Union Estate near Castries, had been developed in earlier years as the Agricultural Station and training centre for Agricultural Cadets, being ultimately given up on the transfer to Reunion in 1913 and had since been intermittently cultivated by lessees. The estate includes an area of 122 acres, of alluvial valley flats, with bush land, and hillsides covered with secondary forest.

It is in direct communication with Castries about 4 miles distant, on a good road, and is surrounded by hills constituting a natural wind-break ; there is a plentiful water supply and a particularly good loamy soil of even texture throughout, with important incidentals such as leaf-mould, timber and bamboo for making pots, all near at hand on the estate. The area suitable for orchard and truck crops is about 80 acres, with the remainder in arable land and forest.

The principal reason for the abandonment of this site appears to have been the flooding by the Union River, which was found to cover periodically a portion of the estate. The damage affected principally the surface truck crops on low land, leaving the established cocoa and the citrus crops intact to the present day.

An examination of the river shows that the cutting of a new channel across an obstructing tongue of land, would allow the river to follow a smooth curve into the main channel and thus prevent scouring, which is the principal objection to this temporary flooding. It should be added that although the year 1928 was the wettest since 1916, no flooding whatever occured. The suggested remedy, however, is a precaution which should not be neglected.

The writer reported as above on the condition of both of the sites, and advised the Government that the Union estate was very suitable for the main crops and particularly for the projected scheme of propagation of fruit trees, as the beginnings of a fresh fruit industry which was rapidly assuming a practical possibility, owing to the opening of the Canadian markets by the direct line of Canadian National Steamships.

His Honour the Administrator. C. W. Doorly, Esq., on whose recommendation the matter was taken up, entered enthusiastically into the scheme and did pioneer work in examining the estate with the writer and experienced agriculturists.

The Government approval having been obtained, it was decided to close down the Reunion Station and transfer all important nursery stock to the Union Estate. The work was commenced in April, 1928, and by the end of the year the Union Estate was functioning as a propagating station and had commenced to distribute plants.

A large collection of adult plants including fruiting citrus, mangoes, dwarf coconuts, and the cane varieties, were successfully transferred during the dry weather of April and May in order to save these from extinction by drought and dieback at Reunion. None of these plants were lost.

By the end of the year, the Station showed an encouraging appearance, the main orchard plots being already established in green manures and a good collection of sour orange stocks had been got together and were being budded.

Green-houses, toolshed and apparatus had also been transferred and put into use.

The Reunion estate is now in charge of a caretaker and remains under the control of the Department until a suitable use can be found for it.

WORK AT UNION STATION AND PLANT DISTRIBUTION.

As stated above, the Union Estate has been taken over by the Department as its main propagation centre, the nursery stocks having been transferred from Reunion and re-established in suitable sites.

Notes on these plants and on new material introduced, are to be found under the following section, Notes on Plots, where some successful methods of plant transportation in a tropical climate and dry weather are described.

Plants, Seeds and Cuttings, distributed during 1928 from the Stations.

	Reunion Experiment Station & Botanic Gardens, Castries.	Union Estate.
Grafted Mangoes	90	28
Budded Oranges	251	—
Budded Grapefruit	30	—
Florida Grapefruit	505	—
Budded Limes	64	—
Grafted Nutmegs	125	—
Grafted Avocados	—	4
Lime seedlings	3,870	—
Pineapple plants	514	298
Papaw plants	—	2,015
Coconut plants	—	46
Total Orchard plants	5,449	2,391
Cane plants	6,919	
Forest trees	761	
Other Economic plants	425	
Total Economic plants	13,554	2,391
Total Ornamental plants and cuttings	384	5
Total Vegetable seeds	114 lb.	

NOTES ON PLOTS ESTABLISHED AT THE AGRICULTURAL STATION, UNION.

The following notes refer to the plots established at Union in 1928, and the more important propagational work in hand, and commence with the first plots encountered when entering the Station along the Castries—Union Road.

Citrus Plot.

This is an area of about one acre lying on the left of the road and bounded on the far side by the Union River. It consists of deep alluvial loam, somewhat liable to cracking in very dry weather, but readily responding to cultivation and supplies of humus. It has a good capacity for growth as can be seen on inspection of the trees established there during the last ten months, the land being abandoned cane-land which has not yet been properly manured. The following permanent plants have been established—

Rows 1 to 5. Grapefruit "Duncan."

Twelve plants of this commercial grapefruit were planted out from the batch of 525 grapefruit imported from Florida in November, 1928. The plants are budded on sour stock of $\frac{5}{8}$ inch caliper and have been planted on mounds to allow of the gradual exposure of a greater length of sour stock, and so increase the immunity to grapefruit stem diseases such as gummosis. The fault of low budding was general in the grapefruit importation and appears to be a practice in Florida in order to evade frost-bite, otherwise the plants arrived in perfect condition and have all grown well, with the exception of one which remained dormant and finally dried down.

Grapefruit "Duncan" is the oldest recorded grapefruit and originated about a hundred years ago in Florida as a seedling planted by a Spanish nobleman and to whom probably many of the older Florida groves owe their existence. The variety is considered the finest early and midseason grapefruit known and the nurserymen report that it is unequalled for all-round desirability. "It's size is exactly what the markets want and pay best prices for—54's to 70's. In shape it is round, slightly oblate and packs well, color a clear light yellow with oil cells showing through the smooth skin. The juice content is heavy and possesses the true sweet-bitter-acid Grapefruit flavour." The season is extended, lasting from early December until late April. Although recognised as the hardiest Grapefruit in Florida, it has not started quite so vigorously as the "Marsh Seedless" in St. Lucia.

Rows 5 to 7. Grapefruit "Marsh Seedless."

Twelve plants of this variety were allotted from the Florida importation and with the exception of one which has been cut back and started again, have done well and are now each forming a head.

The variety is well known to the American fruiterers and is a standard horticultural fruit. It originated about 1895 and is "the only variety of grapefruit that is practically seedless, there being frequently none and seldom more than three or four seeds to each fruit."

It appears on the market in January and holds longer on the tree when ripe than almost any other variety, owing to its seedless character. The fruit is very handsome, with a smooth yellow skin and flesh of fine quality, it is a favourite in the markets where it sells not as a grapefruit, but as "Marsh Seedless". Its sizes are in demand by the fruit trade and it always commands good prices.

Two other plants of "Marsh Seedless" and one of Grapefruit "Conners Prolific" have been established from budwood from Trinidad. The grapefruit were spaced 22 feet by 28 feet.

Row 8. Oranges.

A collection of good oranges has been established and includes the following varieties:—

"Soufrière", a full sweet and juicy orange found in the Soufrière district, season October to December.

"Parson Brown", raised by the Department from budwood. A well known early trade orange of medium size, marketed in November.

"Bowen's late" raised from Trinidad budwood, marketed in December—January.

"Lue Gim Gong", grown from imported budwood, on sour stock. This variety is reported to be an established success. The fruit is large, oblong in shape, and packs from 126 to 176 per box. Colour—a deep orange-red, flavour—a rich blend of sweet and sub-acid, very juicy and nearly seedless. Marketed during March to May and onwards into June (Florida).

"King", orange of the mandarin or kid-glove group. The tree was obtained from imported budwood; the fruit is said to be marketable in March and April, and is of large size and deep colour, with a roughened and medium thick rind. It is a prolific grower and with its late season has been a profitable orange in the States.

In addition to oranges, a tree of "Villa Franca" has been established, being transplanted from Reunion. This variety is held to be the best lemon grown in Florida and is almost seedless.

A few stock trees of the Rough Lemon have also been established in this plot for possible nursery work in providing budding stocks for light soils. The stock is a vigorous grower, it does particularly well on poor soils, and it makes a ready union when budded.

Rows 9 to 19. Budded Limes and Lime Hybrids.

In this collection are several trees of grafted and budded common lime worked on the sour stock, and planted out 22 feet by 22 feet in May 1928. The trees have made vigorous growth and would have set fruit if allowed, although only two years old. During the critical period which followed the transfer by sea and road to this site, these trees were saved from dying by being covered in with open cement casks for two weeks. After which, growth has gone on vigorously without interruption.

These plants have shewn no sign of Wither-tip disease, which was prevalent in the seedling limes during wet weather.

Hybrid Limes.

The remainder of this plot consists of the hybrid limes mentioned in the last Annual Report, which have been transferred from Reunion without mishap and are in general doing well, one tree only has been lost owing to a "bench-root" condition in the stock.

One of the hybrids, No. T. 5, has fruited, with elongated yellow lemon-like fruits, which have been found to carry lemon oil in the rind. This with its general form shews it to be undesirable for trade purposes. Reports from Trinidad state that Hybrid T. 1 is now believed to be in almost every character, a lime such as could be substituted for the present common lime, and a start is being made on hybrid budding on the sour stock, by the use of this local hybrid and by the further introduction of budwood.

All the citrus trees have been alternately dressed with pen-manure, sulphate of ammonia and kainit.

Intercrops.

The citrus plot has been interplanted with secondary and short period crops. The Manila fibre plants (*Musa textilis*), and several bananas have been introduced as shade and shelter. The short period crops consist of a local pine-apple and varieties which have been introduced,—Sugar-loaf, Red Spanish, Black Antigua and Red Riply are represented and a considerable number of these have already been lifted and distributed to planters.

Coffee.

A large number of Jamaica Blue Mountain Coffee plants has been bedded in seed-beds in this plot and the plants have done remarkably well. The Robusta coffee has also been reintroduced but so far has failed to give practical results in the seed-beds, having suffered badly from "damping off."

Of the Blue Mountain Coffee, about 100,000 plants are estimated to be growing, and should be available during the planting season of 1929.

Cover Crops.

The remaining unplanted spaces were cropped in a collection of green-dressings got together during the year. Most of these have seeded and seed is now being collected and distributed to interested planters.

The collection includes several green-dressings new to St. Lucia—

Black eye pea,
Horse-bean (*Canavalia ensiformis*),
Calapogonium mucunoides,
Crotalaria anagyroides,
Crotalaria usaramoensis,
Tephrosia candida,
Indigofera hirsuta,
Bengal bean (*Stizolobium aterrimum*),
Pigeon pea (*Canjanus indicus*),
Dolichos Hosei is being introduced from Reunion.

This concludes the list of material established or seeded in the Citrus plot ; the road-side has been planted in *Gliricidia maculata* as a hedge, and the large trees and bamboos by the river-side have been reduced to proper proportions. The plot has been drained anew throughout and during the present year will be given over entirely to the Citrus orchard, and a definite system of green-dressings will be practised to give these trees every encouragement.

Cacao Plot.

This plot lies opposite the Citrus and on the right of the road. It consisted formerly of 1½ acres of fairly good cacao, mainly Forastera with some Calabacillo, some of the trees being budded on common stock. The plot has been reduced to one acre, and the trees have been cleaned and cared for as far as funds permit. Each tree has been labelled with its number and row, and the forthcoming crop is being recorded for work in selecting good bearing trees and strong growing stocks, as there are indications that some of these trees carry the greater proportion of the crop.

It is hoped to provide good budded trees to replace the seedlings which are appearing in many cacao plantations, and are in the main unprofitable. The reappearance of Cacao as a crop for investigation and improvement will be welcomed by the cacao growers, to whom no assistance in this direction was possible under Reunion conditions. The old system of ringing shade trees such as Immortelle and Castilloa, has proved a failure in this plot, and a number of good cacao trees were crushed when dead shade trees fell intact ; the practical method is to reduce these heavy trees by gradual branch pruning, to a central column which should be kept alive ; or the whole tree system including the roots should be entirely dug out, to obviate the spread of Rosellinia root disease.

Citrus Nursery.

This plot lies next above the Cacao plot and was formed by the removal of some unthrifty cacao. It contains the collection of such sour stocks and rough lemon as could be got together during the year. Budding of the choice oranges including Washington Navel and Parson Brown has been in progress as stocks became suitable towards the end of the year. Budded limes on sour stock have also been propagated for distribution during 1929, the lime budwood being obtained from limes Nos. 6, 7, 11 and 24 of Reunion, which were found to be of higher bearing quality than the common lime (see Annual Report 1927 page 7). Sour orange seeds for stocks were sown in beds and the resultant seedlings culled out to about 30 per cent. There is thus a healthy collection of excellent stocks showing very little variation, such as is due to " bench-roots " and chlorotic seedlings. This collection though small was highly praised by the Citrus Expert. Professor Clark-Powell who visited Union during the early days of re-establishment.

A more comprehensive development of sour stocks for budding will be made elsewhere over about 1 acre during 1929 and the nursery will be used for the actual budding of the more choice citrus such as Grapefruit and Oranges.

This plot also contained a few beds of seedlings of the Blue Mountain Coffee first introduced, and one bed of Hawaiian and selected local Papaws. Of the latter some thousands of plants have been and continue to be distributed. This fruit is in great demand in Barbados, and, if proper packing can be arranged, will fill a want in the Canadian markets, as Canadian visitors have expressed their delight with the papaw which is new to them.

The Department has successfully stored a number of these fruit for about three weeks in local cold storage conditions ; the principal shipping defect appears to be the thin membranous skin which is readily ruptured and becomes infected by a Penicillium green rot.

Mango Plot.

This plot lies on the left of the road after passing over the Union Bridge, and contains a collection of the best mangoes on robust stocks. The land was for some time formerly in cane and consequently was expected to shew signs of exhaustion, but this has been largely offset by a preliminary green-manuring with Horse beans throughout and the use of pen-manure and fertilisers applied to the established trees.

The mangoes were planted 32 feet by 32 feet apart from May onwards and have made vigorous growth ; the following varieties are represented :—

Graham—a new introduction from Trinidad (Annual Report 1927) reputed to be one of the best mangoes for general use ; several plants have already been taken from the original trees by circomposition and have been distributed.

Julie—a well known fruit and general favourite.

Peach—a variety favoured by some growers as distinct from the custard-like flavour of Julie. The fruit is of medium size, firm and sub-acid.

A number of other varieties are represented by trees planted at the lower side of this plot from 1908 onwards, these are "Gordon", "Imperial" and "D'Or", none of which appears to be of special merit and are not being propagated. Other varieties on the Station are "Reine Amelie" (from Martinique in 1908) and "Divine".

It is hoped to complete the list of the best varieties by establishing specimens of "Bombay", "Ceylon" and "Sandersha".

Oranges.

A number of orange trees established during 1908 are still to be found at the edge of this plot. They are planted too near the windbreak and have not done well, having suffered from gummosis stem diseases due to the low union of scion with sour stock. Of these, Pineapple, Parson Brown and Whittaker are the most useful and if found true to type will provide a reasonable amount of budwood for propagation.

Several new plants have been introduced from Porto Rico to complete the orange collection e.g., new Washington Navel, Lue Gim Gong, Ruby and Valencia Late, and have been established in this plot.

Nutmegs.

Plants of a good kind of Nutmeg grown in the Botanic Gardens, have been put out in the plot, including one adult male tree which has been topworked to produce female branches ; these will be very useful in propagation by approach to meet a demand for grafted nutmegs which has been steadily growing throughout the year.

Avocado Plot.

Several new avocados were introduced by the writer in 1928, and these have served as a nucleus for propagation. In the main the root-stocks of these plants have failed to make headway, and it has been necessary to regraft the tops on to local vigorous stocks. Several other avocados have been introduced from Porto Rico, the varieties "Dickenson" and "Fuerte", and the total collection now includes "River", "Nimloi", "St. Anne" and "St. Claire", and two other fruits of good quality. The available space between these orchard trees has been utilised for the germination of mangoes and avocados for pot work prior to grafting, and for supply beds of stocks.

Mango Stocks.

It has been found that Mango "Pierre Louis" a local semi-wild tree much used as a stock for grafting, is not sufficiently vigorous as a stock to choice trees, and investigation has resulted in the choice of "Mango Long", a naturalised tree of robust habit, and generally bearing fruit of a monoembryonic character. In order to ensure a strong single seedling it has been made a practice to bed the seeds after a thorough soaking until germination commences with the splitting of the husk. Each main embryo is then taken out and potted and produces a strong straight rooted stock, such as is difficult to obtain in any ordinary manner.

Avocado Stocks.

These are being raised from selected local seed, put up in pots in the green-house. They are readily grafted by the simple process of beheading the young shoot whilst still watery and inserting a suitable tip from the selected tree in a cleft-like cut downwards

from the shortened shoot. This wedge of young wood is then tied neatly but firmly with raffia, and union takes place in about four days, when the raffia should be gradually loosened to allow of swelling.

Papaws.

A bed of the Hawaiian papaw has been established in this plot for seed supply and observation on suitable shipping qualities.

Ground Provisions.

Yams, including including the Horne, Lisbon, Cush-cush and the Potato Yam, a variety bearing a large number of small potato-like tubers, have been harvested in this area and stored for further work. Sweet Cassava, Blue-top Cassava and the best kinds of Sweet Potatoes have been lifted from Reunion and replanted here to provide material for distribution.

Coconut Plot.

The lot of land lying on the right of the road beyond the bridge has been cleared from abandoned cane stools, and subdivided into two plots. The first plot contains the Dwarf Coconuts transferred from Reunion, which were originally imported in 1924 from the Federated Malay States. These plants consist of the red, yellow and green varieties which have also been introduced into several estates in the Colony, and where planted on good soil they have done remarkably well. Several plants elsewhere were seen to carry above 80 nuts and were fruiting down to soil level although but 4 years of age. The Reunion plants were transferred by being lifted intact, with a ball of earth carefully wrapped in fibre, the leaves being shrouded closely in a cotton cover. After planting, the trees were well soaked and covered in with a tent of palm leaves to reduce transpiration, both tent and cotton shroud being removed gradually as growth commenced. This plan worked extremely well and no plants were lost or damaged.

The plants have been spaced at 30 feet by 30 feet in order to allow of an intercrop of Pigeon peas. Fifteen nuts have been collected from the other dwarf trees, and are being germinated.

The second plot mentioned above has been planted with a selection of best local coconuts, in order to provide information on production and life history, as well as good seed nuts later. The selection so far consists of the following : —

Varieties.—Row (1) a golden-yellow nut of medium size, and a heavy cropper, believed to be less subject to bud-rots than are some other kinds.
Row (2) a large green variety bearing fewer nuts per tree, but a good copra nut, probably somewhat subject to bud-rots.
Row (3) Claret nut, similar to No. (1)—but with a pink fibre, making a handsome water-nut.

The plots are being green-dressed in Bengal bean and planted later with a catch crop of dwarf Pigeon peas in order to assist the establishment of the young coconuts. No further work was done on plot-making in this area during 1928, and the only remaining plot to be described is that of the cane varieties.

Sugar-cane.

The collection of sugar-canes described in the Annual Report 1927 pp. 4—5 has been transferred from Reunion to a temporary nursery on the right of the river, and an early opportunity will be taken to plant these varieties in single variety beds on a larger scale. The area for cane beds lies between the main road and the river above the coconut plot; it is at present in neglected cacao of old standing, for which crop the soil appears somewhat too binding through lack of surface cultivation. The plot has not been planted in sugar cane for many years and is therefore unlikely to convey the Gumming disease.

P.O.J. Sugar-Canes.

Two cuttings each of two varieties of Java cane, P.O.J. 2878 and P.O.J. 2725, have been introduced through the generous co-operation of the Department of Agriculture, Porto Rico. A number of plants have been obtained from these canes and are being grown for propagation under quarantine conditions in the green-house. A special method of rapid propagation has been used to meet the urgent demand for these canes, and as practised in Java and Louisiana consists of what is known as the "Single-eye method"

followed by the " Javan water-sucker " method of division and duplication. By practising the two methods together in Java it was made possible to plant an area of 45,000 acres in five years, starting with one stool only of the Java cane.

The characteristics of these and allied canes which are being introduced, are of interest as these canes form a series of entirely new strains evolved in Java from the crossing of a wild grass-like cane (Kassoer) with a domestic Javan sugar-cane. " Kassoer " itself is a hardy and disease resistant cane of low juice content, and appears to have originated from a natural cross between a wild grass *Saccharum spontaneum* and a tropical cane. The new canes known as the P.O.J. group inherit the robust habit of the wild parent, they are strong feeders and demand a high degree of fertility such as is natural in the rich Javan volcanic soils. Apart from the high sucrose content an important feature is their comparative to absolute immunity to Mosaic disease. Recent research shows that these two varieties (Nos. P.O.J. 2878 and 2725) when cut, retain their sucrose much longer than do the local canes, a great advantage where long haulage and temporary stoppages have to be considered.

Nursery Structures at Union.

Much difficulty was experienced during the early period of the transfer to Union, owing to the absence of a green-house for receiving and nursing lifted plants. A temporary shelter of palm leaves were erected and proved useful. This has now been replaced by a new green-house devised to close up entirely when needed, or otherwise to admit as much air as required ; this fills a longfelt want and has been made possible by utilising the remains of the Reunion structure aided by new material. The house is glazed throughout, with a concrete floor and removable shading ; the cost being £36 not including labour.

Provision is being made for the re-erection of the potting shed near the green-house, for convenience in handling plants and seeds ; for the present this work is being done in the main building.

A cattle-pen is also to be established to provide pen-manure.

Foreman's Quarters.

The Eastern end of the building has been renovated and made into a residence for the Foreman, who took up residence here in November 1928. The former Foreman's quarters have been made over as a bothy for two nurserymen. The settlement of the permanent labourers at suitable points on the estate is being encouraged by an allotment of land for house lots and gardens, and it is hoped by this means to secure regular labour and to effect more complete surveillance of the property against thefts and trespass.

Future Development.

As a means of promoting the intensive propagation of suitable crop plants and quarantine work which form the chief duties of this Station, any further development entails the provision of permanent drains, windbreaks and fences, the deviation of the river already mentioned and the raising of a pasture for stock. It is hoped to include planting of the river embankment with soil-binding trees such as Bamboo, and the clearance of obstructing logs and trees.

FOREST CONSERVATION.

The Department is fortunate in possessing a fairly large area at Union which could be utilised for raising forest seedlings for sale or free planting.

The Colony has a steadily increasing output of forest products, which in 1928 represented a value of £6,196 as against £4,716 in 1927, the increase being largely due to the extension of the charcoal trade, as shewn in the list of exports. Whilst nothing can be said against this industry in so far as it represents the removal of trees in order to plant provisions, every thinking agriculturist deprecates the wanton destruction of organic matter which takes place in firing over land for cassava planting. A plan with possibilities of a cash return would include fallowing the land in a leguminous crop such as pigeon peas, and where this is uneconomic, the bush should be cutlassed down when about to plant and used as a mulch, as no manure is made on such cultivations. Much of the hillsides and drier slopes have in effect become so much waste land through the perennial firing

over by itinerant small planters, and gardens have now to be made in forest land, thereby increasing the cost of production through transport difficulties and lack of attention to these distant sites.

This increase of unproductive land is a serious concern to the Island as a whole ; it is not adequately met by advisory work and will require some form of control to prohibit the burning of land except under certain conditions.

The Department is endeavouring to raise larger supplies of seed of pigeon peas and other legumes for distribution in certain districts, and a supply of forest seedlings is being maintained.

CONTROL OF INSECT PESTS

No serious pests came under notice during the year. *Thrips* were troublesome generally on cacao, becoming prominent after the wet spell of July—October, and in most cases trees in water-logged sites and exposed to the wind were affected.

CONTROL OF FUNGUS DISEASES.

Limes.

The wet season of 1928 caused a reduction of the lime crop, particularly in the wetter areas. No estate made a full crop but on the whole the losses were not so great as was anticipated, a few estates losing about one-third of the usual crop.

The first flowering in January was practically a failure through blossom-blight, but a good recovery was later made and fruiting proceeded with increasing success from March onwards to June, the lower rainfall allowing the main crop of flowers to set their fruit.

Most of the lime trees examined appear to have changed their mode of growth by sending out short-jointed shoots from the bases of leaders spurred back by wither-tip ; these shoots mature rapidly and become woody and have thus an advantage over the usual long soft shoots which are readily diseased and do not flower.

It is evident that treees in good health and well supplied with plant food, more readily recover from the " wither-tip " stage and are able to push dormant buds which usually flower successfully at a later period. This suggests that careful attention to the food metabolism of the plant is likely to lead to useful results. The increased exposure of limes to air and sunlight should proceed concurrently with the improved food-supply, since shade predisposes the lime to " wither-tip " by inducing soft growth which is susceptible to this disease.

Ecologically the lime tree appears to be a semi-xerophyte as shown by the presence of oil-glands, ventral stomata, thorns and an open bush-like habit, and it is probable that a return to a more open cultivation would allow of an increased resistance to a natural parasite, and would utilise the great power of recovery from severe dieback which the lime possesses ; typical examples of recovery are to be found on a successful lime estate in the Colony.

Cacao.

The principal diseases of cacao encountered during the year consisted of *Rosellinia* root disease and cacao pod-rots, both of which were observed to increase following the wet summer. A fairly good price for cacao encouraged the more careful planters to prune, and to collect and lime the diseased pods, a sanitary measure on which much more depends than is generally recognised. Replanting of *Rosellinia* areas with young seedling cacao has in several cases been done, but much more frequently the vacant sites have been planted with coconuts.

Stem-cankers have been properly treated on a few estates and remained apparently normal. In others this disease was responsible for loss of flowering and fruiting " cushions ".

Coconuts.

As mentioned in the previous report, a systematic survey of all coconuts was commenced late in 1927, for which work the two Plant Inspectors have been trained and are proving very useful. Inspection and treatment has been carried forward under the personal guidance of the senior officers, much valuable information has been collected and the sanitation of this important crop has been placed on a definite footing. The following statement summarises the work :—

Number of Coconuts examined and reported on during 1928–1929.

Examined ...	...	324,062	Destroyed	...	161
Affected with disease	...	568	Treated	..	119
(diseased per cent.	...	= 0·17)	Under observation	...	288
			Total	...	568

Under the number affected with disease (568) the following incidence of disease has been observed—

Budrots ...	...	201	Little leaf disease	...	119
Stem bleeding disease	..	7	Withering-leaf disease	...	6
Leaf-yellows	...	67	Bitten-leaf disease	...	100.
Senility ...	...	47.			

A short description of these diseases and methods of treatment is inserted.

Budrot. This is invariably a fatal disease which affects the buds at any stage of development, and frequently when the tree is from two to five years of age. Two principal forms are known—Phytophthora budrot—when the bud is infected by the fungus *Phytophthora palmirora*, and results in the soft rotting of the bud which suddenly falls to one side and can be pulled out ; this is the local form.

The other form which is not so common here is bacterial Budrot ; it is caused by bacteria gaining access to the soft bud, probably through wounds or from infected seed nuts. The bud dries up and can be pulled out from the disrupted tissue which formed the crown, and which readily ferments giving off a strong odour. This form is to be found mostly on seedling plants up to three years old.

A severe attack of budrots occurred in one locality following a heavy rainfall and flood ; the temporary immersion and scouring which took place, resulting in a check to growth and a subsequent epidemic of budrot. Many of the affected trees had to be destroyed, the remainder being treated as described below.

The treatment of budrots generally entails complete destruction by felling the tree and burning the crown and leaves. When, however, the bud is observed to be only lightly affected with brownish patches on the outer young leaves, it has been possible to prevent heart infections by clearing away any diseased matter, and washing the tree with Jeyes fluid and water (5 in 100) or sprinkling the bud with a small handful of equal parts white (slaked) lime and fine salt.

A word of warning is issued against indiscriminate use of a composition formed of white lime, coarse salt and copper sulphate, which some planters use by placing a bag containing anything up to 1½ lb. of this mixture in every coconut bud as a precautionary measure. This method has been tried experimentally and has in practically every case produced a rotting of the tender bud through the caustic action of the mixture, particularly of the copper sulphate. It is important to use only fine salt with air-slaked lime, and this should be thoroughly sprinkled through the crown and bud of the tree.

Little-leaf disease.

This is a serious disease to which several plantations are subject and it has been treated with some indifference. When neglected it has been definitely found in several cases to lead to a budrot and consequent death of the trees. It is known on trees in difficult position such as waterlogged heavy soils, and on shallow arid soils ; it is also found in young trees recently planted and is presumably carried in the seed nut and is also air-borne ; a small yeast is known to be associated with the diseased condition.

The symptoms are a charring and shortening of the bud, which blackens and becomes distorted, and although it may outgrow this condition if well treated, the tree is permanently constricted and dwarfed. The condition appears to return every 4 or 5 years unless treatment is thoroughly carried out in the early stages. This consists of the complete excision of the charred material, and sprinkling the cut surfaces and the crown with white lime or fine salt and lime ; followed by attention to cultivation.

Stem bleeding disease.

This is a diseased condition which affects trees at a stage when a definite trunk has been formed, from five years of age and onwards. The writer has readily induced the disease by pouring a clear suspension of the exuded liquid into fresh cuts made by a cutlass and tarred over.

The disease is characterised by sunken and soft patches of red tissue which usually run upwards and downwards from the site of infection, and ultimately exude a reddish or a clear fluid. The patches may be many and scattered throughout the woody trunk, or confined to one or two areas, frequently about 4 feet above the ground, when they finally increase to an area of several cubic feet causing a soft black decay and excavation of the trunk. Through being cut off from the food supply, the bud dries up and remains *in situ*. The complete excavation of single diseased areas, followed by a scorching with a flambeau, and the immediate application of tar to the hot surface and edges of bark, has proved effective. No treatment appears possible when trees are infected throughout.

Withering leaf and leaf yellows, appear to be due to malnutrition. The first condition is shewn by the frequent breaking down of dry withered leaves which remain attached to the trunk. Decay then starts at the point of attachment where leaf abscission is not complete, and wounds are caused by the premature breaking down. There are indications that this condition may be followed by stem bleeding disease. Most of the trees affected have been situated on exposed arid lands and subject to alternate drought and water logging. Leaf yellows is frequent on trees grown in exhausted soils and exposed sites, it is caused primarily by uncontrolled attacks of leaf-sucking insects, such as scale insects which follow any severe check to the tree. Recovery is general where trees are well supplied with water and plant-food. In the absence of these essentials, the crown becomes dwarfed and scanty and ultimately breaks off or dies from budrots in wet weather.

Bitten leaf disease.

This is fairly common on mature trees and can be recognised by the pruned leaflets which appear to have been sheared off in successive steps. Labourers firmly believe this condition to be due to rats. This is not so however, as the edges of the leaflets continue to die back and the result is partial or complete defoliation.

In severe attacks, the leaf stumps have been pruned off and the bud washed out with lime or Jeyes fluid ; in a few cases the trees have been destroyed.

Senility.

As the name implies this condition is a sign of approaching breakup and is distinguished by an onset of various troubles, such as severe infection of Scale insects and leaf yellows, and the withering and dwarfing of the young leaves. Such exhausted trees may stand for a considerable period, performing no service but that of host to various pests and parasites, and it is not uncommon for these trees to die from budrot during the wet season. Several such trees found near the main plantations were merely serving to introduce disease and have been destroyed.

It is evident that the best coconut land in St. Lucia has now been planted up, and no further effort should be made to plant the dry hillslopes and shallow soils. These may support the coconut trees but such lands yield a poor return and are expensive to work ; should the copra market continue to fall the trees will prove to be unprofitable, they will be neglected, and become dangerous to the adjoining plantations.

The coconut plantations in general require more organic matter and some system of green cover crop should be practised now that a wide selection of green dressings is available.

SUGAR-CANE.

Apart from Gumming disease of sugar-cane, no serious disease of canes came under observation during the year. Gumming disease does not seem to greatly affect the yield where canes are grown properly and no actual gumming of canes has been noted.

The distribution of this crop is becoming more restricted to the principal factories owing to the low prices for cane syrup, a product which is now unprofitable to the peasant proprietor.

PLANT QUARANTINE.

The Plant Quarantine has been more rigidly enforced in view of the risk of introduction of serious pests,—such as the nematode causing Red Ring disease of coconuts, and the Froghopper of sugar-cane ; and of the important diseases, Mosaic of sugar-cane, and Witch-broom of cacao. No plants in earth are now permitted except under special precautions, including the baring and washing of the roots and the burning of the soil.

Eighty-eight importations were inspected and many were passed into the Fumigatorium during the year.

Four prohibited imports of Corn and Coffee and two of Sugar-cane were dealt with by burning the important material under the Plant Protection Ordinance ; this work is of real service to the Colony and its efficiency has been increased by the ready co-operation of the Customs Department.

The following plant material is not permitted introduction into this Colony under the Ordinance as it may be the means of introducing diseases or pests :—

COCONUTS.

(1) Coconuts, coconut plants or any part thereof from all places, except under licence.

BANANAS.

(2) Banana plants or any parts thereof that may have come directly or indirectly from Trinidad, Tobago, Grenada, Central and South America.

CACAO.

(3) Cacao plants from South America.

CITRUS (ORANGE, GRAPEFRUIT, LIMES, ETC.)

(4) The importation of all plants of the Citrus family is absolutely prohibited except under licence.

(5) Coffee, Mango, Guava, Sapodilla and Star apple plants, from the Bahama Islands, Ceylon, Cuba, India, Jamaica and the Philippine Islands, except under licence.

COTTON.

(6) Cotton seed and all parts of the cotton plant are prohibited except under licence, and subject to treatment on arrival.

SUGAR-CANE, ETC.

(7) All plants of the grass family including Sugar-cane, Sweet Corn, Sorghum, are prohibited except under licence.

Exportation of Plant Material.

Exporters of fresh fruits, plants and seeds may obtain information on overseas quarantine and certificates when necessary from the Agricultural Department.

DISEASES AND PESTS WITHIN THE COLONY.

The existence of the following diseases and pests should be notified to the Agricultural Department in order to comply with the requirements of the Plants Protection Ordinance :—

Coconuts—Budrots of Coconuts ;

Sugar-cane—Gumming disease of Sugar-cane ;

Bananas—Panama disease, Marasmius disease, Banana Weevil and Borer ;

Cotton—Pink bollworm of Cotton ;

the presence of the parasites Love Vine and Bird Vine should also be reported. In the case of Wither-tip of limes, although this is still under the Ordinance, the disease is present generally on limes, and the usual notification is not now insisted upon.

Notifications of cases of coconut budrot, diseases of bananas and the presence of Love Vine, were received and dealt with during the year.

ANIMAL QUARANTINE.

Farm Products.

Under Ordinance No. 17 the Governor in Council may prohibit the importation of aminals or farm products which may be a means of introducing disease ; the importation of animals and farm products from the United Kingdom, Isle of Man, and Channel Islands is prohibited ; the importation of animals and farm products from Nevis and Grenada was temporarily prohibited on account of Anthrax.

Importation of Bees.

Under Ordinance No. 18 the importation of any queen bee or bee-keeping apparatus if used, is prohibited except under certificate approved by the Agricultural Superintendent to the effect that Foul Brood has not existed in the apiary or in connection therewith.

FARM STOCK.

The Farm stock of the Department has been augmented by the purchase of two donkeys, and has been reduced by the sale of one ox and the death of the other. One Poland-China boar died from an abdominal abcess during the year at Union.

A pasture is being prepared at Union for the introduction of a suitable bull for breeding purposes.

EXAMINATION OF AGRICULTURAL PRODUCTS.

Analysis of Molasses and Rum.

Further work on these products was undertaken during the year, with the assistance of the College of Tropical Agriculture, through the Imperial Department of Agriculture, and this has been made the subject of a private report.

Examination of Raw Lime Juice.

The examination of raw lime juice in order to determine the origin of discolouration in storage, was proceeded with, and through the co-operation of Professor Clark-Powell, Citrus Expert, Empire Marketing Board, it was possible to obtain further information on the matter from the Research Manager, California Fruit Growers Exchange. A summary of the methods of manufacture and resultant discolouration was provided by the Agricultural Superintendent with indications as to how the discolouration arose, and the following report (abstract) from the Exchange confirms several points which have been discussed in the previous report (Annual Report 1927 pp. 14-15):—

"The darkening of the juice is principally due to oxidation, and takes place rapidly at ordinary temperatures when exposed to the air; it is accelerated by the presence of small amounts of copper and less so, of iron. The absence of scum probably favours oxidation. The presence of scum is probably due to yeast fermentation whereby air in the juice is replaced by carbon dioxide; and the scum serves to prevent surface oxidation by reducing contact with the air.

"It is suggested that air be eliminated from the juice by evacuating before storage, by filling the container from the bottom and the use of an air tight seal. Or the removal of air by blowing carbon dioxide through the juice as stored, or evacuation in storage, and the covering of juice with a layer of tasteless mineral oil as an air seal. Finally, the elimination of heavy metals especially copper, is reiterated, in order to reduce the oxidation reaction". . . .

The full correspondence on this matter is available to interested producers, and acknowledgement is here made of the co-operation of the lecturer in Chemistry, Mr. H. H. Croucher, B.Sc., Imperial College of Tropical Agriculture, through the Imperial Department of Agriculture.

The Department is in correspondence with the Government Chemist of the Laboratory for the Leeward Islands on the question of colouring matter of limes, and has prepared and forwarded samples.

Dessicated Coconut.

Enquiries on the production of, and demand for dessicated coconut were undertaken for a local business firm, and the information was provided by courtesy of the Director of the Imperial Institute. Samples were also received and prices quoted for standard grades, *i.e.* Fine 36/- to 38/- and Medium 36/- to 37/6 per cwt. "ex-wharf" London.

Cool Storage of Avocados.

Cool storage of selected avocados was made in the local Ice Factory towards the end of the crop, and some useful information was obtained and made available to fruit exporters. As a preliminary effort and with difficult storage conditions this trial is not conclusive, but the following indications appear to be safe—

Avocados spoil in temperature of 40 degrees to 55 degrees when over-ripe, with germinated seeds, as indicated by soft, black apical patches.

Packing bruises develop if avocados touch each other and cause spoiling of pears within five days.

Perfect storage can be obtained with well selected fruits, *e.g.* full, green but firm avacados free from bruises, stored at 40 degrees—45 degrees for above 14 days.

PROGRESS IN THE CHIEF INDUSTRIES.

SUGAR.

The area under cultivation remains at about 4,750 acres. The weather was wet, and the factories being in the process of reorganisation did not make a full crop. The output of sugar was therefore low, being 4,042 tons of 1st and 2nd sugars, a decrease of 1,322 tons on the previous year. The average export price realised was £15 8 0 per ton. The amount exported for 1928 was 4,100 tons.

The following figures show the value and quantity of sugar products exported during 1927 and 1928 :—

	1927.	Value. £	1928.	Value. £
Usine Sugar (tons) ...	4,432	74,200	4,100	63,050
Muscovado Sugar (tons) ...	178	2,234	...	...
Molasses & Syrup (gall) ...	156,050	7,633	85,784	3,643
		£84,067		£66,693

RUM.

The production of rum continues to decrease, the following quantities being made at the local distilleries—

1927	...	1,700	proof gallons	value £212
1928	...	1,323	„ „	„ £218

CACAO.

The Cacao market has been fairly steady at from 62/- to 78/- per cwt. for the best cacao and growers have been encouraged to give more attention to the plantations. The exported production for 1928 was 11,006 cwts. This is a decrease of 1,177 cwts. on the previous year, and is mainly due to the short crop harvested owing to the continued wet weather.

1927	...	12,183 cwt.	valued at	£30,560
1928	...	11,006 ,,	,, ,,	£27,321

LIMES.

Owing to Wither-tip disease, the output was below two-thirds of that for the previous year, but was of a considerably greater market value. The quotations for Concentrated Lime Juice increased from £20 per pipe to £23 and £25 c.i.f. Handpressed Lime Oil rose from 38/- to 62/- per lb. and Distilled Oil rose from 25/- to 33/- per lb.

The crop calculated in barrels of fruit was :—

1927	...	58,948 barrels, value as exported lime produce	=£27,426
1928	...	30,107 ,, ,, ,, ,, ,,	=£29,769

COCONUTS.

The yield generally has increased and the output of dry nuts exported rose by about 50,000 during the year. The export of Copra was increased although against this must be set a reduction of Coconut Oil and Soap manufactured locally. The price of Copra had also fallen somewhat, from £28 to £25 per ton. The following products were exported :—

		1927	Value. £	1928	Value. £
Coconuts (number)	...	96,813	349	141,667	499
Coconut Oil (gall.)	...	3,921	734	931	184
Copra (lb.)	...	449,191	4,449	705,721	8,690
Coconut Meal (lb.)	...	15,700	88	8,994	38
			5,620		9,411

PROGRESS IN MINOR INDUSTRIES.

BAY OIL AND BAY RUM.

There was a fair market for Bay products during the year and the following quantity of Bay Oil and Bay Rum was exported :—

		1927	Value. £	1928	Value. £
Bay Oil (lb.)	...	1,908	508	2,326	597
Bay Rum (gall.)	...	12,884	2,112	10,727	1,957
Total	...	...	2,620		2,554

GROUND PROVISIONS.

Ground Provisions such as Sweet Potatoes, Yams, Peas and Beans, etc., were fairly plentiful during the first half of the year, but became somewhat scarce and dear towards the end of the year. No real shortage was in evidence. Excellent Lettuce, Tomatoes, Cucumber and Cabbage have been sold in the markets and there should be little difficulty in disposing of larger quantities as ships' provisions to the Canadian steamships.

In order to facilitate the raising of good vegetables, a large seed supply of selected crops is being imported for propagation and distribution to the small holders.

FRUIT EXPORT.

The production of fresh fruit for export has been stimulated by the formation of a Fruit Growers' Export Association at Soufrière, and careful attention has been given to the shipment of good fruits in crates, to Bermuda and Canada. Several trial shipments of fruits *e.g.* Avocados, Oranges and Grapefruit have been made and these generally have done well ; this trade appears capable of very large extension provided the right kinds of fruit are supplied in the best condition.

To this end the Department has co-operated in the selection, grading and packing of fruit for market, and is prepared to extend this service as demand arises in order that St. Lucia products appearing on the Canadian market shall be of best quality and of attractive appearance.

The total export of fresh fruit is compared below with that of the previous year :—

1927.	Number	Value.	1928.	Number	Value.
		£			£
Oranges ...	13,140	31	...	28,006	50
Mangoes ...	...	594	...	...	1.014
Avocados ..	...	56	...	...	96
Miscellaneous ...	...	1,995	...	...	2,865
Total ...	...	£2,676			£4,025

BANANAS.

Following the closing of the banana estates this industry has relapsed to the local inter-colonial export of various kinds of bananas, principally with Barbados. Arrangements for shipping bananas in cool store to Canada were being made early in the present year and there is now a prospect of a moderate trade being worked up in this manner.

In reviewing the Agricultural progress made during the year 1928, it is evident that a definite step towards recovery has been taken, from the depression existing in 1927. This is not readily evident in the agricultural exports as shewn on the attached list, where the total export value (£148,317) is considerably below that of 1927 (162,883); this difference is due to the low value of the Sugar and Cacao exports and will seriously affect the revenue derived therefrom.

Apart from these items, the total of other exports shows an increase derived from the growing trade in Limes and Coconut products and Fresh Fruits.

The most encouraging factors, however, are provided by the planting community, where a progressive spirit has made itself felt in a search for new crops and an extension of cultivation. In the case of the larger estates, these have invested in grapefruit plants imported from Florida and in grafted and budded orchard plants provided from the nurseries of the Department, or awaiting delivery.

The smaller estates and holdings have taken a part in the demand, and are clearing and preparing more land for truck crops. Generally speaking the peasantry are becoming more settled in agricultural employment.

The fresh fruit and vegetable trade with Canada referred to in the 1927 Report, has now commenced in a small way and holds promise for the careful grower and exporter of fresh produce. Trial shipments of fruits and vegetables need to be undertaken in order to gain marketing experience and to reduce the losses entailed with the shipment of perishable produce.

Much needed information could be provided by a marketing expert ; and until this is possible Canadian importers of tropical products could greatly assist local exporters by reporting the condition of consignments on arrival and make suggestions for improving the appearance of packages and produce.

A comparative list of the principal exports for 1927 and 1928 is attached :—

EXPORTS FROM ST. LUCIA.

		1927	Value £	Total	1928	Value £	Total.
Sugar Products :—							
Sugar, Vacuum Pan	Tons	4,432	74,200		4,100	63,050	
,, Muscovado	,,	178	2,235		...	...	
Molasses and Syrup	Gall.	156.050	7.634		85,784	3,643	
Rum ...	p. Gls.	1,700	212	£84,281	1,323	218	£66,911
Cacao Products :—							
Cacao ...	Cwt.	12,183	30,560	30,560	11,006	27,321	27,321
Lime Products :—							
Concentrated Lime Juice ...	Gall.	38,064	8,783		18,028	4,998	
Raw Lime Juice ...	,,	17,509	967		12,598	631	
Distilled Lime oil...	,,	995	9,904		1,159	12,261	
Essential H.P. Otto of Limes ...	,,	379	5,366		518	9,820	
Green Limes ...	Barrels	2,070	2,317		1,553	2,014	
Lime Seeds ...	Lb.	25,847	89	27,426	7,428	45	29,769
Coconut Products :—							
Coconuts ...	No.	99,813	351		141,667	499	
Copra ...	Lb.	449.191	4,409		705,721	8,690	
Coconut meal ...	,,	15,680	88		8,994	38	
Coconut oil ...	Gall.	3.921	735	5,583	931	184	9,411
Honey Products :—							
Honey ...	Lb.	37,339	410		21,263	237	
Beeswax ...	,,	676	24	434	372	20	257
Cotton Products :—							
Sea Island lint ...	,,	923	82	82	...	...	...
Bay Products :—							
Bay Oil (9 lb per gall.) ...	,,	1.908	508		2,326	597	
Bay Rum ...	Gall.	12,884	2,112	2,620	10,727	1,957	2,554
Spices :—							
Nutmegs ...	Lb.	9.793	380		5,246	326	
Mace ...	,,	2,133	288		981	85	
Miscellaneous ...		...	153	821	...	283	694
Fresh Fruits :—							
Oranges ...	No.	13,140	31		28,006	50	
Mangoes ...	...	...	594		...	1,014	
Avocados ...	...	...	56		...	96	
Miscellaneous ...		...	1,995	2,676	...	2,865	4,025
Banana Products :—							
Bananas ...	Bchs.	27,052	2,351	2,351	5,543	338	338
Forest Products :—							
Logwood ...	Tons	640	2,027		940	2,338	
Charcoal ...	Bags	38,205	1.819		46,371	3,107	
Miscellaneous Forest Products	...	...	870	4,716	...	751	6,196
Miscellaneous Products :—		...	1,333	1,333	...	841	841
Total Exports		...	...	£162,883	...	...	£148,317

AGRICULTURAL INSTRUCTION IN THE PRIMARY SCHOOLS.

Report of the Agricultural Superintendent on the Teaching of Agriculture in the Primary Schools of St. Lucia during 1928.

The year 1928 was the twentieth year of agricultural instruction in Primary Schools. The examination was conducted by the Assistant Agricultural Superintendent between October 29th and November 22nd. The number of pupils presented for examination was 381 as against 351 in 1927, and was a satisfactory symptom of the interest taken in the agricultural classes.

Forty-five girls were taught agriculture as against 16 last year, and this in itself is an important development which is being encouraged, in view of the work that the girls will be called to undertake later on, when the male members of the household hire themselves out or emigrate for short periods, leaving the women in charge of the gardens.

The distribution of economic plants grown in School gardens was not satisfactory. It should become an established principle that a boy or girl should propagate and grow suitable fruit trees and come to look upon them as their own property, and ultimately be allowed to take a plant and establish it at their homes. These the Teacher could visit and comment on the behaviour of the plants, drawing attention to successes and failures and the reasons therefor. This would provide a much more stimulating lesson than does the sale of trees to local planters, and is only fair to the pupils.

Only one School (Vieux-Fort) paid a visit to the local plantations and the Inspector reports that great benefit was derived from this visit. In future the agricultural class will not be awarded full marks unless a visit to a neighbouring plantation has been made and a lesson drawn therefrom.

More attention should be given to the selection of plants for stocks, and for budwood and grafts; a much needed lesson on this can be learned by a visit to the propagation nurseries at Union. The Teachers have it in their power to assist largely in the dissemination of useful choice fruits throughout the Island by the propagation of a number of the best trees suitable for each district. Conversely, the indiscriminate growing and distribution of inferior or diseased plants would do much to destroy a young industry. The Teachers should keep in close touch with the Agricultural Department and should obtain their supplies of selected budwood and grafts, seeds and plants, as required through the Department.

Mon Repos school garden did so little work that no marks were awarded. The position of the agricultural class of this school is being gone into, as the district appears to be a promising one.

E. A. WALTERS,
Agricultural Superintendent.

EXAMINER'S REPORT.

Castries Anglican Juvenile.

The old garden at this school has now been utilised as a building site hence a new garden was shewn this year. A great deal of real practical work has been accomplished in a short time, and the successful removal of large fruit trees has been a useful object lesson to the pupils. A large quantity of vegetables is continuously grown and the general appearance is quite as good as that of the old garden. It is also interesting and instructive to note that use has been made of all waste pieces of land near the school. Selection of seedling stocks, and careful grafting of choice fruit trees, will add to the usefulness of this garden.

Castries Wesleyan Juvenile.

The garden was cropped with various vegetables and these were receiving proper attention. This garden is small in relation to the size of the agricultural class, and although a good deal of practical work is done, this should be augmented by work in boxes and pots which could be put in charge of individual boys. The pupils showed great interest in some budding and grafting work which was in progress. This can be added to by the grafting of choice avocados in pots.

Riviere Doree Anglican Juvenile.

The work done at this school reflects very creditably on the Teachers and pupils. Every part of this large garden shows evidence of care and attention. At the time of examination the plots were cropped with yams, cassava, cabbage, tomatoes and other useful vegetables. Large quantities of sour orange and mango "Long" seedlings have been raised, and budding and grafting practised successfully on a fairly large scale, but more attention is necessary in the selection of seedlings as stock plants.

Castries R.C. Boys' Juvenile.

The theoretical work at this school was very satisfactory and the practical demonstrations were ample to illustrate the class work; but the garden plot is small and considering the size of the class the practical work should be largely augmented by the use of boxes and pots and thus provide work for every boy. Careful grafting of selected avocados and other fruit trees, should form a large portion of next year's outdoor work.

Micoud R.C. Juvenile.

The theoretical knowledge at this school was very good and the practical demonstrations were ample for the class work. The garden though sandy and somewhat poor gives excellent results from the large quantity of stable manure which is being constantly buried. At the time of examination the beds were cropped with cabbage, tomatoes, egg-plant and papaws; and other vegetables were growing remarkably well. At this garden there is always something new keeping the interest of the agricultural class alive; papaws were successfully bottle grafted and shewn at the examination. Heavier soil should be brought in and lightened with some sand for useful propagation work in boxes and pots.

Soufriere R.C. Boys' Juvenile.

The practical work has shewn improvement. Propagation of economic plants by various methods was being carried out, and the pupils showed keen interest in the work. A plot of land near the School was being fenced by the Manager, and this from its position should offer greater facilities for work and observation as soon as it is brought into use. The old garden should be retained and cultivated as an orchard of selected fruit and other economic trees, for propagation work. The theoretical knowledge was good.

Choiseul R.C. Boys' Juvenile.

Useful work is being done in the garden at this school. Budding and grafting of economic plants have been carried out on a fairly large scale, but greater attention to the selection of seedlings as stock plants is necessary. Interesting experiments with local crops have been arranged and the results should be carefully noted and explained. The empty garden beds should be green-dressed during the dry months of the year.

Saltibus R.C. Juvenile.

The practical work has shewn improvement. The garden plots were cropped with yams, tomatoes, eschalot and various other local vegetables. The manurial experiments were useful, but should be arranged to shew only one thing at a time. The district is suited for fruit growing and special attention should be given to propagation work during the next year. Beds of avocado pears should be sown and the plants potted as soon as they germinate, for grafting purposes. Selected sour orange seedlings should be grown and budded with choice oranges and limes.

Anse-la-Raye R.C. Juvenile.

Useful work is being done in this school garden in spite of it being washed by the river nearly every year. Budding and grafting of economic plants form a great part of the practical work, but better selection of seedlings for stock is necessary. A new piece of land away from the river has been provided by the Manager, and this will help in securing results of experiments. The old garden should not be abandoned, and more selected fruit trees should be added to what are already established, and used in future propagation work.

Canaries R.C. Juvenile.

A good deal of practical work has been done in this school garden, but the crops are constantly being stolen before they mature, and this is very discouraging to the class. A number of selected stocks of avocados, sour orange and mango "Long" should be grown for budding and grafting, and the pupils should be given such plants as are successfully propagated. With this in view the pupils would exercise better supervision on the garden and thus discourage pilfering. Large numbers of selected stocks of avocados, sour oranges, and mango "Long" should be grown and budding and grafting practised. The present arrangement of beds and walks is bad, the beds should be rearranged and the walks should be widened to enable the pupils to move about more easily.

Laborie R.C. Boys' Juvenile.

This school has fallen off somewhat in agriculture. The garden beds require a liberal dressing of pen manure, flat forking and rearrangement, and work will not be satisfactory until this is done, as the soil is poor. Budding and grafting have received attention but larger numbers of selected seedlings for stocks should be grown so that the distribution of grafted plants to the class can be increased. The Teachers should then note the behaviour of the plants distributed in the garden book.

Vieux-Fort R.C. Boys' Juvenile.

The practical work here has shewn improvement. The protection from wind afforded by hedges and pigeon peas is better than last year and this must be kept up to enable useful work to be done. Liberal applications of pen manure are still necessary and in the absence of manure more green dressings should be attempted. Budding and grafting should be done in boxes and pots to enable the plants to be sheltered from high winds during the early part of their growth. The pupils seem more interested in agriculture than formerly.

La Ressource R.C. Combined.

This school has a large and very useful garden. At the time of the examination it was cropped with yams, cassava, cabbage and various other vegetables, most of which were arranged as experiments to show interesting results. Over 100 budded and grafted fruit trees were prepared for neighbouring planters, and these were grown in a very careful manner; unfortunately these plants were sold away from the school.

Much more encouraging work would be obtained if the pupils were given these plants to establish at their homes, and an occasional inspection could be carried out by the Teachers and results noted down in the class book.

Forestiere Wesleyan Combined.

The improvement noted last year has been maintained. The garden is cropped with beds of ginger, onion, garlic, cabbage, yams and bananas and other vegetables, and cultivated in such a manner as to serve as an object lesson to the peasants of the district, and these are making good use of it. Budding and grafting have received attention but not enough selected stocks of economic plants are raised. Grafting of choice avocados and mangoes should form an important part of the practical work next year, and the school should apply to the Agricultural Department for help in selecting budwood.

Babonneau R.C. Combined.

This school garden is a large one and is situated in a somewhat dry district of the Island. It should be worked with a view to demonstrating improvements in the crops of the district and the introduction of new crops such as onions, garlic and grafted mangoes. At the time of the examination the plots were cropped with various plants, but the arrangement and cultivation was not very instructive. Plant propagation especially by budding and grafting requires attention.

Dennery R.C. Boys' Juvenile.

This garden is difficult to work, irrigation can be practised but this must be done with care to avoid washing. The soil is thin and should be built up by the incorporation of large quantities of stable manure. Propagation by budding and grafting should receive more attention.

Mon Repos R.C. Juvenile.

Agriculture is not taken seriously at this school. Only two boys were presented for examination in a district where the entire village population depends on Agriculture for a livelihood. Both boys and girls should be taught Agriculture, but on the contrary so little was done that no marks could be awarded. The entire garden should be manured, flat forked and then divided up properly into straight beds, and all stock plants should be dug out and burned. Fresh selected seedlings of avocados, mango "Long" and sour orange should be raised to begin work in budding and grafting. A bed of pineapples should be established as a representative crop of the district.

List of Marks and Standing of Schools in Agricultural Teaching.

Schools.	No. of Pupils Examined.	Condition and use made of garden.	Practical work and knowledge.	Theoretical Knowledge.	Total.	Percentage.	Result Note.
Possible Marks	—	10	10	10	30	100	—
Castries Anglican Juvenile	53(a)	10	10	9	29	96·6	E.
Castries Wesleyan Juvenile	26	8	9	10	27	90	E.
Riviere Dorée Juvenile	5	10	10	7	27	90	E.
Castries R.C. Boys' Juvenile	69	8	9	10	27	90	E.
Micoud R.C. Juvenile	17	8	9	10	27	90	E.
Soufrière R.C. Boys' Juvenile	43	7	8	10	25	83·3	V.G.
Choiseul R.C. Boys' Juvenile	30	8	9	7	24	80	V.G.
Saltibus R.C. Juvenile	12	8	8	8	24	80	V.G.
Anse-la-Raye R.C. Juvenile	10	8	9	7	24	80	V.G.
Canaries R.C. Juvenile	32(b)	7	8	8	23	76·6	V.G.
Laborie R.C. Boys' Juvenile	21	7	8	8	23	76·6	V.G.
Vieux-Fort R.C. Boys' Juvenile ...	17	9	8	6	23	76·6	V.G.
La Ressource R.C. Combined	7(c)	9	9	5	23	76·6	V.G.
Forestiere Wesleyan Combined	9(d)	8	9	6	23	76·6	V.G.
Babonneau R.C. Combined	18(e)	7	8	7	22	73·3	G.
Dennery R.C. Boys' Juvenile	10	7	6	8	21	70	G.
Mon Repos R C. Juvenile	2		No	marks	award	ed.	

(a) including 20 girls. (b) including 14 girls. (c) including 1 girl. (d) including 3 girls. (e) including 7 girls.

RESULTS OF PUPIL TEACHERS EXAMINATION IN AGRICULTURE, 1928.

Agriculture.

Name.	School.	Possible Marks 100.
Boniface Edmund ...	Laborie Boys'	52
Nelson Paul	Vieux-Fort	50
Willie Andrew	Anse-la-Raye	46
Joseph Romain ...	Soufrière Boys'	43
George Williams ...	Vieux-Fort	28
Charles Amos	Dennery	24
Kent Hippolyte ...	... ...	11
Philip Finister	Gros Islet	4
1st Year.		
Lennox Chalon	Choiseul Boys'	84
Harald Gajadhar ...	Forestiere	66
Remy Fannis	Canaries	63
C. H. Eugene	Castries R.C. Boys'	50
Joseph Beausoliel ...	Soufrière R.C. Boys'	34
Jerome Peter	Vieux-Fort	29
2nd Year.		
John Alexander ...	Saltibus Juvenile	58
Martineau Nelson ...	Soufrière	39
3rd Year.		
G. H. Skeete	Riviere Dorée	79
Boniface Placide ...	Laborie Boys'	56
A. Faucher	Choiseul Boys'	50
L. G Lesmond ...	Dennery Boys'	50

(Sgd.) R. W. NILES,
Examiner.

January 30th, 1929.

LECTURES TO TEACHERS.

The Agricultural Superintendent gave a course of Lectures in Agriculture to the Head Teachers and Assistant Teachers of the Primary Schools, from August 13th, to 16th, inclusive ; the use of the Anglican Schoolroom, Castries, was kindly loaned for the indoor work. His Honour the Administrator addressed the Teachers in the lecture room on Tuesday morning.

The subjects taken were :—

(1) *The production of useful plants,* a descriptive practical lecture on improved nursery technique, methods of reproduction, selection and transplantation of crop plants.

(2) *The necessary requirements of an agricultural soil* ; a survey of the raw material from which soil is made and methods of selecting good soil, improving tilth and fertility, soil reaction and application of lime.

(3) *Important plant diseases*, consisted principally of Coconut budrots, Little-leaf disease and deficiency diseases, with a short resumè of the present state of diseases in St. Lucia.

(4) A botanical foray through the Gardens, Castries, where plants and trees economic and ornamental were inspected and their uses described. Plants undergoing propagation, stocks and scions in the nursery were inspected.

A visit to Union was made during the afternoon, where the imported orchard stock, nursery and field plots were examined, and the objects of the Station explained.

Thirty-four Teachers and seven visitors attended the Lectures.

An elementary course in Botany and Chemistry was given by the Agricultural Superintendent to Forms IVa, IVb and III of St. Mary's College, Castries, thoroughout the year.

LESSONS TO PUPILS OF PRIMARY SCHOOLS.

The Agricultural Officers inspected School Gardens and gave instruction in the Schools during the year.

AGRICULTURAL WORK AND INSTRUCTION IN THE COUNTRY DISTRICTS.

The Agricultural Superintendent made sixty-eight prolonged visits and many shorter visits to estates and holdings during the year ; very much increased travelling was necessary owing to the development of Union Estate, and to the frequent calls by visitors.

Increased visits were made by the Assistant Superintendent to the small planters, and towards the end of the year it became possible to arrange matters so that the Assistant Superintendent could concentrate on peasants' advisory work almost exclusively. Ultimately it is hoped to provide for this important work by the creation of an office as Peasants' Advisor.

REPORT ON THE WORKING OF AGRICULTURAL CREDIT SOCIETIES.

The report summarises the work done during the year in connection with the Agricultural Credit Societies, of which only six Societies are now operating.

No regular meetings were held during this period and no real attention was given to the repayment of loans.

Only one Society paid up interest in full and £6 6 9½ towards the loan.

Three Societies paid a part of the interest due and nothing on the Loan. Two Societies paid neither interest nor loan. The total amount paid in by the Societies was £31 4 11 on a debt of £809 5 2½, and this had increased to £835 9 2 at the end of the year through the accumulation of unpaid interest.

Notwithstanding the efforts of the Inspector, very few partial payments were made by members and the Trustees made no progress with this scheme.

This is the final report of this Department on the Agricultural Credit Societies, for by instruction from the Government, this work in future is to be carried out through the Treasury Department.

THE FOLLOWING REPORT IS SUBMITTED BY THE INSPECTOR, MR. R. W. NILES.

I have the honour to submit my thirteenth Report on the working of Agricultural Credit Societies of St. Lucia for the period January 1st, to December 31st, 1928.

Six Societies still continue to operate and very little progress has been made towards winding up their affairs although this is desirable. Constant efforts have been made to collect outstanding debts.

At the beginning of the year the Societies owed Barclays Bank £809 5 2½. During the year the accumulated interest on this was £57 8 10½, of this latter amount Anse-la-Raye Credit Society paid £5 6 7. Laborie Credit Society paid £2 2 6, Choiseul Credit Society paid £6 9 0½ and Soufrière Credit Society paid £11 0 0; The Societies of Micoud and Dennery paid nothing. Thus leaving a balance of £32 10 9 to be added to the principal and bear compound interest.

The Choiseul Credit Society also reduced their advances by £6 6 9½. Consequently at the end of the year the indebtedness of the Societies had increased to £835 9 2.

The Gros Islet Agricultural Credit Society was dissolved during the year.

A detailed report on the working of each Society follows:—

DENNERY:—

This Society consist of 76 members. During the year they paid nothing towards the reduction of principal nor interest. consequently their indebtedness increased from £165 17 0 at the beginning of the year to £177 13 3 at the close of the year.

MICOUD:—

This Society consists of 56 members. On January 1st, they owed Barclays Bank £85 19 8½. During the year they paid nothing towards interest or principal, consequently at the end of the year their debt stood at £92 3 10.

SOUFRIERE:—

This Society consists of 69 members. They began the year with a large debt of £237 11 10. During the year they paid only a part of the interest due, and allowed the principal to increase to £243 7 10 at the close of the year.

CHOISEUL:—

This Society consists of 34 members.

At the beginning of the year their debt stood at £93 1 1 of which the small sum of £6 6 9½ and the annual interest was paid in during the year, leaving a debt of £86 14 3½ at the close of the year.

LABORIE:—

This Society consists of 61 members. On January 1st, they owed Barclays Bank £74 11 1½, during the year they paid only a part of the interest due and thus allowed the debt to increase to £77 14 10 at the close of the year.

ANSE-LA-RAYE:—

This Society consists of 40 members. At the beginning of the year their debt stood at £152 4 5½; during the year they paid only a part of the interest and at the close of the year their debt had increased to £157 17 1½.

General Remarks.

The Trustees could, if they were willing do a great deal towards collecting interest and advances from the members. Although constant attempts have been made by the Inspector to convene meetings, not one regular meeting has been held by any of the Societies during the year, hence there has been no real business, and little repayment of advances or interest.

The Trustees with the aid of the other officers should convene meetings and compel members owing the Society to attend, or sue them in the Magistrate's Court and collect their advances. This action has been carried out by one Society in the case of certain members.

I beg to thank the various Parish Priests and Secretaries for the help they have given in connection with inspection work of the Societies.

Appended are—

A.—Statement of Loan Account of the Societies.

B.—Balance Sheet of Soufrière, Micoud and Choiseul.

APPENDIX A.

Loan Account.

Name of Society.	Membership.	Amount of Loan 1.1.28. £ s. d.	Amount paid during 1928. £ s. d.	Amount owing 31.12.28. £ s. d.	Remarks.
Dennery (*a*) ...	76	165 17 0	...	177 13 3	
Micoud (*a*) ...	56	85 19 8½	...	92 3 10	Rate of interest—7%.
Soufrière (*b*) ...	69	237 11 10	...	243 7 10	
Choiseul (*c*) ...	34	93 1 1	6 6 9½	86 14 3½	All loans overdue.
Laborie (*b*) ...	61	74 11 1½	...	77 14 10	
Anse-la-Raye (*b*) ...	40	152 4 5½	...	157 15 1½	Loans due to Barclays Bank.
		809 5 2½	6 6 9½	835 9 2	

(*a*) Interest not paid. (*b*) Interest partly paid. (*c*) Interest paid in full.

APPENDIX B.

SOUFRIERE AGRICULTURAL CREDIT SOCIETY.

Balance Sheet at 31.7.28.

	Dr. £ s. d.	*Cr.* £ s. d.
Loan Account		14 14 11
Reserve Fund		19 10 0
Working Account	29 6 10	
Cash to Credit	4 18 1	
	£34 4 11	£34 4 11

Statement of Revenue and Expenditure.

Revenue.

	£ s. d.
Loan and Interest repaid by members ...	16 4 2

Expenditure

	£ s. d.
Paid Barclays Bank	31 1 4 †
Stamps	2
Secretary (honorarium)	6 0 0
Cost of remittances	1 10
Messenger	1 0
Audit fee	1 0 0
	£38 4 4

SOUFRIERE AGRICULTURAL CREDIT SOCIETY.

Statement of Assets and Liabilities.

Assets.

	£ s. d.
Cash to credit	4 18 1
Owing by members on account of Principal	174 2 9
Interest	96 16 8
	£275 17 6

† £19 10 0 of this amount temporarily borrowed from the Reserve Fund.

Liabilities.

	£	s.	d.
Reserve Fund (temporarily borrowed)	19	10	0
Owing to Barclays ; Principal and interest to 31. 3. 28 ...	235	19	1
Excess of Assets over Liabilities	20	8	5
	£275	17	6

MICOUD AGRICULTURAL CREDIT SOCIETY.

Balance Sheet at 17.2.28.

	Dr. £	s.	d.	Cr. £	s.	d.
Loan Account	9	3	8½			
Working Account	9	3	0½			
Reserve Fund				18	10	0
Cash to Credit		3	3			
	£18	10	0	£18	10	0

Statement of Revenue and Expenditure.

Revenue.

	£	s.	d.
Interest paid by members	10	11	1
Refund of loan	14	11	4
	£25	2	5

Expenditure.

	£	s.	d.
Barclays Bank—Interest	7	5	11
Barclays Loan Account	12	2	11
Honorarium to Secretary	4	10	0
Auditor's Fee	1	0	0
Stationery		1	0
	£24	19	10

CHOISEUL AGRICULTURAL CREDIT SOCIETY.

Balance Sheet at 31.5.28.

	Dr. £	s.	d.	Cr. £	s.	d.
Working Account	22	11	9			
Loan Account				15	10	6
Reserve Fund				11	8	0
Cash to Credit	4	6	9			
	£26	18	6	£26	18	6

Statement of Revenue and Expenditure

Revenue.

	£	s.	d.
Collected from members on Account of			
Interest	18	4	6
Capital	17	19	10
	£36	4	4

Expenditure.

	£	s.	d.
Honorarium to Secretary	4	0	0
Audit fees (1927 & 1928)	2	0	0
Barclays Bank	32	14	2
	£38	14	2

ADMINISTRATION.

REPORT ON THE WORKING OF THE REUNION AND LAND SETTLEMENT.

Land Settlement.—Of the 46 lots comprising the Reunion Land Settlement, 39 have completed payments, making a total sum of £912 15 6 to date. Payments are still being made on the seven lots which remain, and the instalments were fairly well collected.

Choiseul Village Extension.—The remaining twenty-three lots in this Extension remained unsold during the year.

The Revenue derived from Reunion Estate was :—

	£	s.	d.
Instalments on Land Settlement	6	12	6
Instalments on Village Extension	9	3	0
House Lots and Land Rents	2	11	0
Rent of Reunion Bungalow	4	0	0
	£22	6	6

The lots were, as usual, cropped in ground provisions, fruits and sugar-cane.

CORRESPONDENCE AND DISTRIBUTION OF INFORMATION ON AGRICULTURAL MATTERS.

One hundred and seventy Minute Papers and one thousand two hundred and fifty-eight letters were dealt with during the year ; information was supplied and official returns rendered for the Blue Book, Canadian Trade Commissioner, International Institute of Agriculture, Rome ; Imperial College of Tropical Agriculture, Trinidad ; The Imperial Institute, London ; The Stock Exchange Official Intelligence, London ; West India Committee Circular, London ; and the Overseas Settlement Committee, United Kingdom.

The meteorological work in co-operation with the United States Weather Bureau, Porto Rico, was improved.

The following papers were printed and distributed :—

" Notes on Lime Cultivation " and " Planting of Grapefruit " by the Agricultural Superintendent ; and a number of copies of a pamphlet entitled " Suggestions for Grapefruit Culture in St. Lucia " by Professor H. Clark Powell, Citrus Fruit Expert.

Two papers " The Banana Industry of St. Lucia " and " Soil Conditions in Tropical Agriculture " by the Agricultural Superintendent appeared in the Journal of Tropical Agriculture, of the Imperial College.

The following books were added to the Library :—

" Nature Teaching " New Edition, by Sir Francis Watts, K.C.M.G., D.Sc., F.I.C ; " Citrus Diseases and Their Control " by H. S. Fawcett and H. A. Lee ; " Practical Bee Keeping " by L. Hopkins ; " Diseases of Animals " by N. S. Mayo, M.S., D.V.S. and " Genetics in Relation to Agriculture " by Babcock and Clausen.

EXPENDITURE AND REVENUE.

	£	s.	d.
Personal Emoluments	947	0	0
Transport and Subsistence Allowance to Agricultural Superintendent and Staff	40	0	0
Subsistence Allowance Assistant Agricultural Superintendent (fixed) ...	36	0	0
Transport Allowance Agricultural Superintendent	48	0	0
Forage Allowance Assistant Agricultural Superintendent	48	0	0
Labourer Agricultural and Botanical Station, Reunion and Castries Botanic Gardens	350	0	0
Seeds, Plants, Manures, etc., and plant disinfection	50	0	0
Miscellaneous Requisites	40	0	0
Printing, Binding and Purchase of Books	8	0	0
Maintenance of Transport Animals, Carts and Pedigree Pigs	24	0	0
Minor Repairs to Buildings	10	0	0
Contingencies	15	0	0
Freight and Transport of Plants	10	0	0
	£1,626	0	0

A Supplementary Vote of £79 8 1 was provided for the redevelopment of Union Agricultural Station.

Revenue.

Revenue derived from the sale of nursery stock, produce, &c., from the Agricultural Stations was :—

	£	s.	d.
Botanic Gardens, Castries	13	7	11
Experiment Station, Reunion	31	0	7
Union Station	2	7	0
Land Settlement, Rents, &c.	22	6	6
	£69	2	0

OFFICIAL VISITORS TO THE STATIONS.

His Excellency Sir Frederick Seton James, K.B.E., C.M.G., Governor and Commander-in-Chief, Windward Islands, and Lady James ; His Honour C. W. Doorly and Mrs. Doorly ; Mr. H. A. Ballou, M.Sc., Imperial Commissioner of Agriculture for the West Indies, Trinidad ; Hon. A. E. Collens, F.I.C., F.C.S., Government Chemist and Superintendent of Agriculture for the Leeward Islands, Antigua ; Mr. R. E. Kelsick, Agricultural Superintendent and Chemical Assistant, St. Kitts ; Mr. C. A. Gomez, Curator, Botanic Station, Montserrat.

The following visits on special work were made during the year :—

Professor H. Clark Powell, B.Sc., Transvaal University College, made a tour of the Island on Grapefruit investigation on behalf of the Empire Marketing Board, following which his report approved the importation of Florida Grapefruit trees as a nucleus of plants for commencing grapefruit production.

Dr. C. W. Wardlaw, Ph.D., D.Sc., F.R.S.E., carried out an investigation of the banana lands as Pathologist of the Banana Research scheme of the Empire Marketing Board ; and Mr. H. H. Croucher, B.Sc., (Lond.) Lecturer in Chemistry, Imperial College of Tropical Agriculture, Trinidad, made a tour of the principal estates on soil investigation.

Other Visitors to the Stations.

There was a large number of visitors to the Stations during the year.

STAFF CHANGES.

The Agricultural Superintendent was absent on vacation leave from August 24th, to September 6th, 1928.

The Assistant Agricultural Superintendent on sick leave from November 27th, to December 1st, 1928.

Mr. W. W. Arno, Clerk to Agricultural Superintendent was absent on vacation leave from January 1st, to February 29th, 1928.

Mr. Bennett Williams, Banana Inspector, was absent on vacation leave from December 1st, to 31st, 1928.

On the closing down of the Experiment Station, Reunion, Mr. E. L. Daniel, Foreman, was transferred to Union on November 24th, 1928.

METEOROLOGICAL OBSERVATIONS.—APPENDIX I.

STATION, CASTRIES, ST. LUCIA, B.W.I.

LONGITUDE=60° 59′ 49″ W. LATITUDE=14° 0′ 36″ N. H=10ft.

Month.	Air Temperature.				Absolute Max. and Min.			
	7 a.m.	12 noon	5 p.m.	Mean	Max.	Date	Min.	Date
January	75·1	83·1	79·7	79·3	87	2nd	63	8th
February	75·7	63·2	80 8	79·9	89	26th	68	13th
March	74·8	82·8	80 4	79·3	88	21st	68	9th
April	76·1	83·7	80·8	80·3	89	6th	68	2nd
May	78·6	85·8	82·3	82·2	90	25th	70	4th
June	79·2	85·1	81·9	82·0	90	1st	69	28th
July	79·2	85·4	82·2	82·3	89	18th	68	5th
August	79·1	85·6	82·1	82·3	90	3rd	72	31st
September	78·7	86·3	82·5	82·5	92	11th	71	1st
October	78·0	84·1	81·4	81·3	89	1st	68	18th
November	78·1	84·4	81·6	81·6	89	2nd	68	3rd
December	77·6	83·3	80·9	80·6	88	1st	68	28th
Year ...	77·5	84·4	81·4	81·2	92	11th Sept.	63	6th Jan.

APPENDIX II.

THER. *ht.*=3′ 0″ RAINGAUGE *hr.*=1′ 0″. STATION CASTRIES.

Month.	Rainfall (inches)			Weather.		Wind. No. of Observations of								
	Total	Max.	Date	Days of Rain	Days of Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm
January ...	6·50	0·83	16th	26	0	0	0	24	58	0	0	0	0	11
February	4·94	1·45	1st	20	0	0	0	23	56	0	0	0	0	8
March ...	5·16	0·69	2nd	26	0	0	0	69	12	0	0	0	0	12
April ...	5·01	0·85	14th	28	0	0	1	75	7	0	0	0	0	7
May ...	2·35	0·75	15th	15	0	0	0	83	9	0	0	0	0	1
June ...	6·25	0·95	27th	26	2	0	3	34	47	0	1	1	0	4
July ...	12·03	2·65	17th	26	1	0	1	29	53	0	2	0	0	8
August ...	13·14	3·96	7th	23	0	0	1	40	24	0	0	0	0	28
September	11·95	3·37	12th	25	2	0	3	33	21	0	2	2	0	29
October ...	18·00	3·45	9th	21	0	0	0	42	11	0	0	0	0	40
November	14·96	2·86	10th	25	0	0	0	46	8	0	0	0	0	36
December	5·96	1·69	17th	22	0	0	0	73	6	0	0	0	0	14
Year ...	106·25	3·96	7th Aug.	283	5	0	9	571	312	0	5	3	0	198

MEMORANDUM ON METEOROLOGICAL CONDITIONS FOR THE YEAR 1928, ST. LUCIA, B.W.I.

Rainfall.—The total rainfall recorded at the Botanic Gardens, Castries, for the year 1928 was 106·25 inches. This was 16·32 inches above the average for the last 38 years (=89·93 inches) and was the highest rainfall recorded since the year 1916. Maximum precipitation occurred on August 7th, with a rainfall of 3·96 inches.

The distribution of rainfall throughout the year was generally above normal, particularly during July, August, September, October and November, when many stations recorded above 10 inches precipitation for each month.

Temperature.—Temperature records at the Botanic Stations, Castries, show a Mean Noon temperature of 84·4 degrees in the shade; the maximum temperature was 92 degrees, the minimum temperature was 63 degrees, temperature range being 29 degrees.

Weather.—The weather generally was wet and cool, no high temperatures occurring, with but one exception; this took place on the 11th, September, when a hurricane of severe intensity and wide range formed north-east of St. Lucia and passed in a northerly direction during 12th September, little damage being occasioned. The temperature range during the 24 hour period was 19 degrees (Maximum 92 degrees, Minimum 73 degrees).

The rainfall recorded was 4·80 inches in 24 hours.

RAINFALL RETURNS, 1928.

Observation Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Maximum in one day and date.		No. of days on which rain fell.
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.		
Gros Islet, Reduit Estate	2·75	2·22	4·58	1·97	·62	2·71	8·30	7·39	9·42	9·80	13·22	4·82	67·80	4·51	Sep. 12th	169
Castries, Corinth ,, ...	4·47	3·60	5·42	4·13	1·83	4·31	10·23	9·92	11·84	14·64	14·29	5·73	90·41	4·99	,, 12th	204
*Marquis Estate ...	...	4·75	4·47	3·73	2·44	4·06	12·64	...	10·26	13·64	15·87	5·34	77·20	4·90	Nov. 6th	176
† Union Exper. Station	.	...	...	...	...	4·84	11·22	10·21	11·95	13·79	14·87	4·60	71·48	3·62	Sep. 12th	182
Choc Estate ...	4·78	3·94	4·86	3·43	1·61	4·25	10·79	10·33	12·25	14·47	12·01	4·14	86·86	3·57	Aug. 7th	216
Botanic Gardens ...	6·50	4.94	5·16	5·01	2·35	6·25	12·03	13·14	11·95	18·00	14·96	5·96	106·25	3·96	,, 7th	283
*Government House ...	3·65	1·03	...	...	...	...	...	...	...	...	...	...	4·68	·50	Jan. 27th	36
The Barracks, Vigie ...	5·05	3·80	4·04	3·54	1·75	5·17	10·10	10·57	10·39	14·36	12·29	5·11	86·17	3·15	Aug. 7th	207
Soucis Estate, Cul-de-Sac	4·90	4·98	4·21	4·56	1·87	6·75	9·81	10·20	12·83	16·05	12·55	6·16	94·87	3·72	Oct. 22nd	197
*Crown Lands Est. ,,	...	...	...	...	...	...	...	...	...	...	16·09	6·21	22·30	3·75	Nov. 10th	49
La Perle Est., Roseau	6·64	3·70	4·85	4·77	1.59	6·86	11·61	11·50	11·14	11·54	14·35	6·75	95·30	3·80	,, 10th	218
Mont D'Or Est., ,, ...	6·82	4·84	5·24	5·11	2·05	7·99	12·55	12·15	11·07	16·49	14·82	7·93	107·06	3·75	,, 10th	248
Belair Estate, Roseau	...	4·65	4·57	4·56	1·75	6·44	...	13·48	11·23	15·60	13·44	6·90	82·62	3·59	,, 10th	201
Vanard ,, ,, ...	5·26	4·29	6·12	4·92	2·17	8·00	12·34	12·30	11·85	18·38	17·07	7·48	110·18	3·75	,, 10th	226
Ravine Poisson, Estate	10·13	7·07	10·56	7·12	2·84	8·09	14·00	15·03	13·82	19·69	19·72	8·38	136·45	3·70	Aug. 7th	189
Soufrière, La Perle Estate	8·35	5·37	5·86	5·73	2·62	8·40	14·10	13·74	15·68	12·45	13·89	5·91	112·10	4·31	Sep. 15th	180
Ruby Estate ...	7·96	5·49	5·85	5·04	2·24	8·18	14·70	13·33	14·69	11·80	13·39	5·26	107·93	4·09	,, 15th	263
La Dauphine Estate ...	7·12	4·89	6·65	5·19	2·52	9·02	14·13	14·45	13·40	9·76	15·39	9·07	111·59	4·22	Aug. 7th	278
Union Vale ,, ...	5·32	3·53	4·36	2·50	1·53	7·63	9·36	12·71	9·55	7·35	9·94	5·78	79·56	3·60	,, 7th	204
Beausejour ,, ...	8·15	5·94	8·26	5·96	2·92	9·42	14·75	13·86	14·38	9·80	17·86	9·55	120·85	4·17	,, 7th	290
‖Chois.. Ag. Exper. Station	3·52	2·44	4·11	2·87	·53	5·23	7·39	...	...	...	...	...	26·09	1·50	Jun. 27th	162
‡ Morne Lezard Estate...	...	...	...	...	...	...	...	10·42	10·29	7·38	12·38	8·85	49·32	3·10	Aug. 7th	119
Park Estate ...	7.16	4·76	8·87	4·64	2·11	8·95	12·23	11·32	10·31	8·73	14·66	8·52	102·26	3·72	,, 7th	267
Woodlands Estate ...	6·18	5·32	6·89	4·51	2·95	8·44	13·46	9·07	15·95	14·28	15·57	6·42	109·04	3·19	Nov. 6th	267
Laborie, Londonderry Est	5·50	4·01	7·17	4·27	1·56	7·16	9·62	9·74	9·00	7·80	12·66	8·95	87·44	3·68	Dec. 16th	287
† Giraud Estate ...	...	...	8·18	3·47	1·15	9·55	11·61	9·81	11·28	8·87	15·01	10·05	88·98	4·52	,, 16th	160
Black Bay ,, ...	6·25	·97	3·75	1·70	·95	3·50	5·80	5·90	5·20	6·08	10·19	4·68	54·97	2·36	Oct. 22nd	106
Vieux-Fort. Retraite Est.	5·64	2·91	5·31	3·61	1·37	6·77	7·94	7·45	6·87	6·36	12·29	5·96	72·48	2·55	Jun. 27th	169
Moule-à-Chique Estate	1·61	·90	2·50	1·51	·92	5·65	4·67	4·79	3·96	6·88	8·24	4·28	45·91	2·08	,, 27th	154
Beausejour Estate ...	4·26	1·93	4·34	2·21	·84	4·76	5·73	5·95	4·36	6·84	10·75	5·29	57·26	2·55	Nov. 6th	161
Pointe Sable ,, ...	3·38	1·62	4·01	2·82	·97	4·83	5·29	6·35	4·36	7·30	11·03	4·30	56·26	2·34	,, 6th	143
Micoud, Troumassée Est.	5·12	1·63	3·52	2·71	2·50	7·27	7·44	7·76	4·32	15·40	7·92	2·09	67·68	5·59	Oct. 10th	140
Dennery, Mamiku Estate	3·48	3·13	3·91	3·55	1·21	5·19	7·49	8·64	8·47	10·32	12·57	6·16	74·12	2·42	,, 9th	283
Errard Estate ...	6·50	4·72	3·88	3·93	1·93	8·27	9·30	11·12	9·91	10·79	15·51	6·83	92·69	3·06	,, 9th	219
Prospect ,, ...	6·38	4·59	7·21	6 35	2·86	8·55	12·77	13·40	11·15	13·44	16·14	7·67	110·51	3·32	,, 9th	289
La Cayé ,, ...	4·12	3·20	3·81	4·86	1·24	4·18	9·17	10·11	6·91	10·75	10·72	3·99	73·06	2·52	,, 17th	158
Ressource ,, ...	4·18	2·87	4·02	3·83	1·13	4·19	7·74	8·04	6·82	11·61	8·38	5·30	68·11	2·90	Sep. 12th	159
Richfond ,, ...	4·40	3·63	3·61	4·41	...	...	7·07	8·41	7·14	12·75	8·33	4·24	63·99	2·44	Oct. 17th	144

* Incomplete. † New Stations. ‡ Recommenced Observations. ‖ Rainguage transferred to Union Experiment Station.

PRICES OF NURSERY PLANTS, ETC.

The prices of plants do not include the cost of the boxes or baskets, for which a charge will be made if not returned to the Department.

All prices specified are for plants of ordinary quality. The prices of plants not included in this list will be fixed by the Agricultural Superintendent.

When Nutmegs are supplied by the owner for grafting, a charge of 6d. will be made for each plant on delivery; other grafted nutmegs supplied by the Agricultural Department will be sold at 9d. each.

An addition of 100% is made on the price for all plants supplied for export from the Colony.

No plants are supplied on Public Holidays.

At least six months previous notice must be given when large quantities of such plants as Coffee, Cacao, Nutmegs, Citrus, Cane plants, etc., are required as it is not feasable to keep large supplies of these on hand. At least six months' notice is required for large supplies of budded citrus, the sour stock for which have to be specially propagated.

Complaints as to the quality or quantity of plants, etc., supplied or as to the prices charged, should be made in writing to the Agricultural Superintendent.

PLANTS.

Oranges	6d per plant
Oranges Sour	3d ,,
Grapefruit Budded	9d ,,
Lime Plants (seedlings)	1/- per hundred
Lime Plants Budded	6d per plant
Mangoes Grafted	1/- ,,
Coffee Plants	2/6 per hundred
Cacao	2d per plant
Nutmegs Grafted	6d and 9d per plant
Avocado Pear	3d per plant
Avocado Grafted	6d ,,
Eucalyptus	2d ,,
Cane Plants	1/- per hunded
Guava	3d per plant
Casuarinas	1d ,,
Palms (various)	6d ,,
Ornamental Plants (various)	2d to 1/- per plant
Seeds (various)	3d to 6d per lb.
Seeds Vegetable	3d to 6d per packet
Plants for wind-breaks, hedges, etc., other than the above mentioned	1d to 2d per plant

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